

Agricultural Waste Briefing Paper

- 1.1 This paper summarises the Agricultural waste opportunities in Hampshire required to meet the Vision of the MRS. The waste stream overlaps with waste streams covered by other papers on **ELVs** (tyres, vehicle batteries, scrap metal) and **Metals**, **Plastics** (packaging, cellophane, plastic chemical packaging, packaging), **Glass** (containers, redundant glass structures), **Construction & Demolition** (old barns, hard standings), **Hazardous and chemical wastes** (fertilisers, pesticides, asbestos, sheep dip) and **Wood** (construction materials, chippings from trees and hedges) and the other **biowaste papers** (green, food waste and wastewater).
- 1.2 **The main opportunities to meet the MRS Vision**
- 1.3 **Locally**
 - The MRS partners should support a more integrated approach to the management of agricultural waste to encourage its sustainable reuse and disposal, while recognising the need for favourable conditions for investments in the treatment companies. The MRS partners should support this development
 - The MRS partners should support the wider data collection to establish quantities and end use of waste products in particular within agricultural waste.
- 1.4 **Regionally:**
 - The MRS partners should keep a close working relationship with the South East of England Regional Assembly (SEERA), the South East of England Development Agency (SEEDA), the National Farmers Union (NFU) and other relevant organisations in order to maximise the opportunities for infrastructure development within the county and to ensure that the right methods are introduced.
- 1.5 **Nationally:**
 - The government must provide clear leadership with regards to the changes in the legislative systems and the impacts that this will have on agriculture and its waste management.
 - The Agricultural Waste Stakeholders Forum and the National Farmers Union (NFU) will need to work together to provide advice and guidance to farmers on waste disposal issues.
- 1.6 **Europe:**

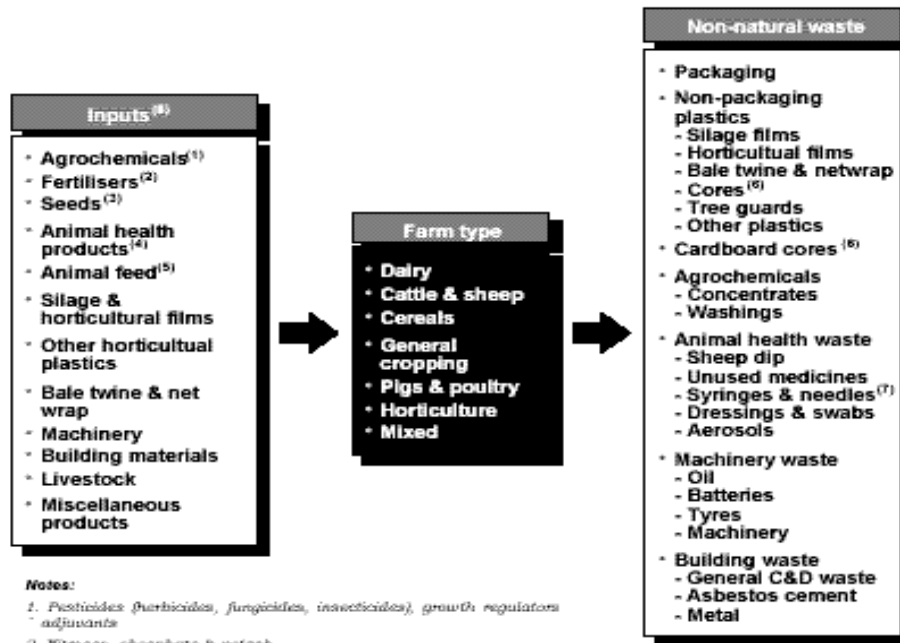
- The MRS partners should monitor and support the European Union in their efforts to help the industry find more sustainable and environmentally friendly methods of disposal of agricultural wastes.

Current agricultural waste resources situation in Hampshire

2.0 'Agriculture is a unique and diverse industry that is currently undergoing considerable change' (ESTET, 2003). Agricultural activity has the potential to create large amounts of waste.

2.1 Agricultural biowastes includes wastes from farms, horticulture, fruit growing, seed growing, dairy farming and livestock breeding and keeping, the use of land as grazing land, meadow land, osier land, market gardens and nursery grounds, and the use of land for woodlands where that use is ancillary to the farming of land for other agricultural purposes. Manures, slurries, silage effluent, crop residues, vegetable and plant waste, animals, and animal by-products are all classified as agricultural biowastes. There are also many types of non-biowaste wastes associated with the agricultural waste stream.

Non-natural agricultural waste arisings



Notes:

1. Pesticides (herbicides, fungicides, insecticides), growth regulators, adjuvants
2. Nitrogen, phosphate & potash
3. Often treated with chemical dressings
4. Sheep dip, medicines, syringes, etc.
5. Can contain medicinal components
6. Used for silage and horticultural films, bale twine and netwrap
7. Plus other equipment, such as guns and tubes, used to administer vaccines and treatments
8. The total annual cost of these material inputs is estimated to be in the order of £5 billion, while the total annual production output is approximately £75 billion (from MAFF data for UK agriculture in 1999).

(Source – ESTET, 2003)

2.2 Agriculture also produces many non-biowastes such as machinery and building wastes, which are covered under other resource streams.

2.3 Levels of the different types of agricultural waste produced in Hampshire and nationally are hard to determine due to the nature of the methods of disposal which are currently used being so unregulated at present. Using a model, which estimates waste or by-products generated per head of livestock or hectare of land use, the Environment Agency, in their Strategic Waste Management Assessment (SWMA) for the South East, has calculated agricultural waste and by-products arising for 1998.

2.4 No data is available for 2001 for the agricultural waste stream. The nearest data on this waste stream comes from 1998 where it is estimated that approximately 990,000tpa of agricultural waste was produced in Hampshire. For the purpose of this paper therefore, the 1998 figure has been taken as the baseline.

2.5 The overwhelming majority is animal matter and animal wastes which make (92%) of the waste stream, and vegetable and plant waste makes up a further 7%. The remaining wastes makes up the remainder. As the majority of wastes are animal matter and vegetable and plant wastes, which are treated and disposed of on farms (mainly to land), such wastes do not require facilities that fall within the remit of development control

Table 1- Agricultural Waste and By-Products Arising in Hampshire, Portsmouth and Southampton (1998) based on type of Waste Quantity ('thousand tonnes)

Waste	Quantity ('000 tonnes)
Animal Matter	909,300
Vegetable/Plant Waste	72,500
Pesticide Washings	2,800
Plastics/Polymers	1,100
Tyres	500
Vehicles and Machinery	500
Oils	500
Sheep Dip	400
Milk/Rubber/Glass	300
Paper and Card	200
TOTAL	988,100

(Source: Strategic Waste Management Assessment for the South East, Environment Agency, 2000).

2.6 Slurry and manures form a large proportion of the wastes produced on farm's throughout Hampshire.

Existing recovery routes and infrastructure in Hampshire

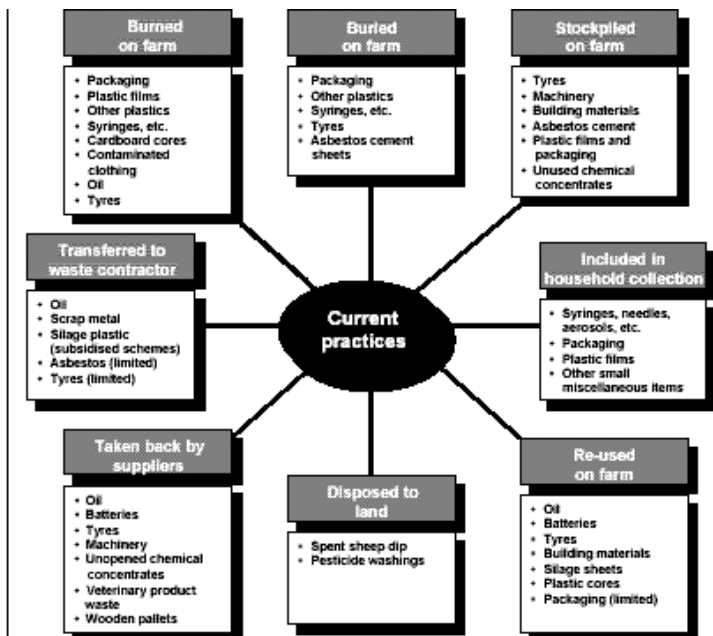
3.0 Current Resource Management

3.1 There is little data currently available on disposal routes for agricultural waste in Hampshire. However, experience suggests that the majority of this waste is retained on site to be reused, composted (Entec, 2004), or burnt either at the farm or in an incinerator and there is some transfer of waste off site. The Agricultural Waste Survey provides the most reliable information to date on current practices for managing agricultural waste.

3.2 Agricultural wastes are currently disposed of in a number of ways. It can be assumed that the most common practices of disposal for agricultural wastes is to store and spread wastes on farm. For example, the majority of animal matter and vegetable and plant waste is stored or spread on land. Vegetable wastes are often composted and reused or spread on farm. Other waste such as pesticide washings can generally be disposed of on land as long as they are away from watercourses. The majority of the other agricultural wastes highlighted are buried or burnt on farm. It is likely that large amounts of agricultural waste are reused or recycled in some way, however an exact figure on the amount of wastes which are actually recycled cannot be determined. The key findings of the Agricultural Waste Survey show that nationally 90% of holdings are disposing of at least one waste stream using one or more practices. Other data highlights that '83% are burning waste in the open, 32% are using farm tips or burying waste and 77% are putting waste in the household dustbin' (Agricultural Waste Survey, 2003). The survey also shows that 96% of farmers transfer some waste to others for disposal whilst 70% store some wastes with no plans for disposal on site.

3.3 Overview of current practices

3.4 The main disposal options which are currently practiced can be seen in the following diagram.



(Source: Environment Agency, 2001)

3.5 Landfilling is a common practice of waste disposal on farms. Many farms have their own landfill, dumps or tips which until now have not been monitored. Traditionally, landfilling has been used for a variety of purposes including for the disposal of animal carcasses. However, recent animal by-product regulations ban the disposal of animal carcasses in this manner from May 2003 following the BSE and foot and mouth crises. Carcasses now have to be either incinerated or taken away by abattoirs. Other materials traditionally landfilled in the past include asbestos and other hazardous wastes.

3.6 'The practice of spreading suitable waste material on land to improve its fertility is as old as agriculture itself. These days there are tighter controls on waste disposal and inorganic fertilisers are widely available, but these techniques still have their place' (Environment Agency, 2004). Not only does the farmer benefit from the improved soil fertility, but the waste is put to a sustainable good use. The waste is potentially beneficial if spread correctly. Regulations currently state that waste produced on land can be spread on the farms they originate from up to the benefit of the crop and anything other than this waste used has to be treated as a waste. Waste agricultural chemicals can also be spread on land in some cases as long as they are not close to watercourses, but this is not believed to be practiced currently in Hampshire.

3.7 'Open burning is still the most common practice for the disposal of packaging, plastic films and other plastics' (Environment Agency, 2001). Burning has traditionally been done through a number of methods including through drum incinerators where wastes such as pesticide containers and bottles have been burnt in the past.

3.8 Incineration is also practiced on some farms, but large-scale incineration is only practiced sparsely on farm due to the costs. Incineration of such wastes pose massive costs to the farmers if they choose to use this as a method of disposal and this explains the lack of uptake. Most on farm incineration takes place in homemade drum incinerators. The incineration directive has essentially made on farm incinerators non-cost effective.

3.9 Farms may have anaerobic digesters which are used for waste disposal. Anaerobic digestion reduces the bulk of organic waste by converting it into a relatively stable solid residue (digestate) similar to compost. Unlike composting, however, anaerobic digestion requires an oxygen-free environment (i.e. anaerobic conditions) for the specialised bacteria to function. The process produces a flammable gas consisting mainly of methane and carbon dioxide (biogas) and is particularly suited to wet, organic wastes. Biogases produces can also be used to produce electricity, although up to one third of it may be needed to heat the digester itself, since the process requires warm conditions.

3.10 The main methods of disposal have been discussed. However, it is likely that other methods of disposal are undertaken but there is a lack of evidence and data to suggest what these entail.

3.11 Social Issues

3.12 One of the main barriers to sustainable waste management of agricultural waste is low farmer awareness and motivation. Research has shown the general difficulties of raising farmer awareness and experience in other countries have demonstrated that overcoming this barrier is essential. Ongoing economic difficulties and recent crises (such as the foot and mouth disease epidemic) are likely to have a negative impact on the motivation of farmers. The NFU runs a number of awareness campaigns presently on a variety of issues associated with agricultural wastes. This includes awareness campaigns and workshops on the consultation for the agricultural waste regulations which took place in February and March 2004 (these took place before the regulations were put out for consultation by DEFRA as the date of release has been put back) and campaigns on fly tipping. The NFU also operate a weekly newsletter raising awareness to farmers on key agricultural waste issues.

3.13 Traditionally, the public and industry do not perceive agriculture and farming as a commercial operation. There is a clear need for a change in public perception with regards to this matter to develop awareness of agricultural waste issues and management.

3.14 Environmental Issues

3.15 Farm “waste” can be a valuable asset to a farm, which can be used to make substantial reductions in the application of manufactured fertilisers to the land.

3.16 Bringing agricultural wastes under the control of the waste management licensing system is likely to result in environmental benefits. A number of potentially polluting activities such as the landfilling of hazardous and chemical wastes will become prohibited under the regulations and thus can only be deemed environmentally beneficial.

3.17 Spreading can be restricted to certain times of the year and quantities dependant on waste. For example, slurries are often stored on site during the winter when it is not suitable to spread and then spread once during the spring and summer months when the climatic conditions are more favourable. Spreading on land particularly of slurries and manures must be tightly controlled to avoid any incidents of pollutants entering the watercourses. If this does occur, massive ecological damage would result. Such polluting incidents have decreased in recent years according to the Environment Agency, and this likely to be a result of tighter and more effective management and spreading procedures.

3.18 A number of land use controls implicate the waste disposal techniques, which can be applied onto land. These include groundwater protection zones and Nitrate Vulnerable Zones (NVZ). The application of organic farm waste to land should not exceed the recommended rate of nitrogen, particularly in relation to the impending NVZ legislation. In addition, the phosphorus content

of the manures should be taken into account, to avoid excessive enrichment of soil phosphorus levels. Other environmental designations such as SSSI, SAC, SINCS etc will all also have an impact on the use of agricultural wastes on land.

3.19 Diseased animal carcasses present a particular disposal problem. It should be expected that the recent foot-and-mouth crisis in agriculture will not be typical of the industry in the future, because of the additional regulation and controls that have been introduced. New regulations introduced in May 2003 however make it illegal for animal carcasses to be landfilled on site.

3.20 Fly tipped wastes often pose huge environmental problems for farmers and the environment as a whole. Waste often finds its way onto agricultural land and it is the responsibility of the farmer, regardless of whether it is his waste or not, to dispose of it effectively. Fly tipping provides additional costs to farmers and many perceive that nothing is being done with regards to restricting and helping them to cope with the issues associated with fly tipping.

3.21 Economic Issues

3.22 The collection of agricultural wastes does already occur for some wastes such as slurries and animal carcasses. The NFU are currently looking into setting up a more intense system for the collection of animal carcasses and it is hoped a system will be in place by the autumn of 2004. However, the total costs of establishing waste collection procedures along with the recovery or disposal depends on a variety of different issues. These include costs associated with transportation, cleaning, segregating, disposal/recovery gate fees and the landfill tax (if applicable). The costs of dealing with agricultural waste collection is potentially high due to a number of issues highlighted in the Agricultural Waste Survey such as:

- The wide geographical distribution of farms (with some in remote locations);
- The wide range of wastes;
- The small quantities of wastes compared to other industries;
- The seasonal arising of many wastes;
- The bulky nature of some wastes, particularly plastic packaging and silage plastics;
- The levels of contamination on some wastes, particularly waste silage plastics and horticultural plastics;
- The difficult and hazardous nature of some of the wastes.

3.23 It is important not to overlook the potential economic benefits which could be associated with the effective management of wastes on farm. For example, organic agricultural wastes could be composted, saving money otherwise spent on fertilisers and providing a potential income for farmers and the resulting compost can then be spread onto the farmer's land also saving costs.

3.24 Codes of Practice:

- Agricultural Waste – Codes of Agricultural Practice for the Protection of Water, Soil and Air
- Best Farming Practice –Profiting from a good environment (Environment Agency, 2001)
- Agricultural Waste Survey 2003
- Agri-Environmental Schemes – 2 levels of entry: the entry levels for all farms and then environmental stewardship scheme for farms who want to develop the scheme further.

3.25 Current Legislation:

- EU Landfill Directive
- Animal By products Order
- Landfill (England & Wales) Regulations 2002
- Environmental Protection Act
- Nitrate Vulnerable Zones (England and Wales) Regulations
- Special Waste Regulations 1996, Waste Management Licensing
- Groundwater Regulations 1998
- EU Waste Framework Directive (75/442/EEC as amended by 91/156/EEC)
- EU Animal By products Order 1999 as amended 2001
- Protection of water against agricultural nitrate pollution (1996)
- Environmental Protection Act
- Agriculture Act 1947
- Incineration Directive

3.26 Current Key players

3.27 The **National Farmers Union** (NFU) is the organisation for farmers and growers in England and Wales, representing around three quarters of the full time commercial farmers of England and Wales. Its central objective is to promote successful and socially responsible agriculture and horticulture, while ensuring the long-term viability of rural communities.

3.28 The **Hampshire Farming Partnership** was set up in September 2002. The aim of the partnership is to maintain an overview of changes and trends in agriculture and related sectors in Hampshire, and to use informal influence to help shape future policies and programmes. The partnership also monitors changes and trends in farming and related sectors in Hampshire and the impact of policies and programmes, produces the Hampshire Farming Study, identifies gaps in implementing the recommendations and act on them where possible, disseminate information and feeds into related policies, strategies and plans at local, regional and national levels.

3.29 The **Committee for Rural Hampshire** is a partnership group umbrella organisation made up of members from a wide range of organisations with an interest in the future of Hampshire's countryside. The Committee acts as a forum to discuss and draw attention to rapid changes going on in Hampshire countryside and the implications of these changes.

3.30 Supporting Organisations

3.31 The **Agricultural Waste Stakeholders Forum** involves DEFRA, the Environment Agency, the National Farmers Union and a range of other organisations with interests in agricultural waste.

3.32 The **Environment Agency** regulates waste management through a system of licences. The Agency registers and monitors the transportation of waste and advice on waste management methods.

3.33 The **Department of the Environment, Food and Rural Affairs (DEFRA)** is the Government department with prime responsibility for waste and resource management, as well as other forms of environmental protection and the promotion of Sustainable development.

3.34 The **Composting Association** is the United Kingdom's membership organisation promoting good practice in composting and the use of composted materials. The Association acts as a central resource for composting, researching, collecting and disseminating information and works to provide a united voice for composting in the UK, speaking to Central and Local Government about the benefits of composting and compost use.

3.35 The **Waste and Resources Action Programme (WRAP)** is a not-for-profit company supported by DEFRA, the DTI, and the devolved administrations of Scotland, Wales and Northern Ireland. It is working to promote sustainable waste management by creating stable and efficient markets for recycled materials and products.

3.36 The **Agricultural Industries Confederation (AIC)** is the voice of the industry allied to agriculture. They lobby vigorously at both UK and EU levels on behalf of our members to influence and inform policy makers.

3.37 **The Countryside Agency** is the statutory champion and watchdog working to make the quality of life better for people in the countryside and the quality of the countryside better for everyone.

3.38 The **Henry Doubleday Research Association (HDRA)** is Europe's largest organic membership organisation. It is dedicated to researching and promoting organic gardening, farming and food.

3.39 Examples of Current Best Practice

3.40 On farm composting already takes place in Hampshire at a number of sites. Such sites are small in scale and are operated currently under exemptions which mean they can only store a maximum of 1000 m³ of green waste any time which equates to a maximum annual capacity of 3,500 tonnes. Hampshire Waste Services operate a number of on farm sites such as Rockbourne in Fordingbridge and Down Farm in Odiham (See the Green Waste Biowaste paper for further details).

3.41 **Windover Farm, Longstock, Stockbridge** – This site is the location of a new waste digester, which turns agricultural wastes such as manure and slurry into an odourless fertiliser or soil conditioner. Natural bacteria converts organic material into a usable by products. Hampshire inventor Chris Reynell has set up the company who has established this scheme under the name Bioplex and the scheme involves a special trailer (‘ portagester trailer’), which can be transported and filled with waste and transported back to the farm where it is then filled with liquids full of anaerobic digesting microbes. Any methane gas which is collected is used to provide energy to heat the wastes and excess electricity generated is sold back to the national grid.

3.42 **Holsworthy Biogas** is the ‘first large-scale centralised anaerobic digestion plant for cow slurry in the UK’ (Devon County Council website, 2004). The plant uses anaerobic digestion of animal and food processing residues to generate energy. The plant ‘has the capacity to process 146,000 tonnes per annum of cattle, pig and poultry manure plus organic food waste (20%). The manure is collected from 30 local farms within a 5-6 miles radius of the plant. The system provides a renewable source of combined heat and



Holsworthy Biogas
Plant
(DCC. 2004)

power, and provides numerous direct and indirect benefits to the community. The total gas production is budgeted to 3.9-million m³ methane per year (this equates to 39 million kWh of energy per year). They have a combined total power capacity of 2.1 MWe with a budgeted gross power production of 14.4 million kWh per year. The gas fuels two Combined Heat and Power units, which can generate over 2 MWe of electricity, and a similar quantity of heat.

3.43 The **National Fallen Stock Scheme** has been developed by the National Fallen Stock Company. When the scheme is rolled out (expected Autumn 2004), all livestock farmers will be able to access the Scheme on payment of a nominal annual registration fee. Farmers may choose their preferred approved collector and will pay costs of collection less the government contribution by monthly variable direct debit to the Company according to quantity of stock collected over the previous month. Collectors will need to comply with strict bio security conditions.

3.44 **Reading Agricultural Consultants Environmental (RACE)** is based in Didcot, Oxfordshire and is currently looking into setting up a farm waste-recycling scheme in Oxfordshire. The consultancy specialises in waste management activities on farm as well as fertiliser planning, pollution control and waste management systems. One of the schemes set up involves co-operative working with regards to waste management. The scheme covers all waste streams associated with agriculture and is a voluntary schemes which farms can be subscribed to co-ordinate waste recycling systems throughout farms within Oxfordshire. The farmer pays a subscription which funds the scheme and all additional funds raised are ploughed back into the scheme itself. RAC is committed to the sustainable management, development and conservation of rural resources, acting on behalf of clients with an interest in agriculture, rural development and countryside management.

Potential agricultural waste issues up to 2020

4.0 Future Data Required

4.1 The quantities of agricultural wastes being processed in the county needs to be investigated.

4.2 Data on agricultural waste disposal methods, routes and end products associated with agricultural wastes with regards to its destination, the type of treatment it is subjected to and its possible future uses would be extremely useful with regards to future potential markets for agricultural wastes. This would also help in the development of disposal options and markets.

4.3 Data on the locations of all farms practicing waste management in Hampshire. This should then be regularly updated to see the capacity situation in Hampshire.

4.4 Future legislation

4.5 Agricultural waste is currently excluded from many of the controls that apply to waste produced by other sectors. However, there are a number of important legislative changes planned which will greatly impact the agricultural waste stream.

4.6 The Agricultural Waste Regulations will extend waste management controls to agriculture in 2004. The regulations mean that waste management legislation will be extended to agricultural wastes and wastes will need to be disposed of or recycled in ways that protect the environment and human health. Proposed changes to legislation in the future will make some agricultural wastes controlled wastes.

4.7 Until this legislation is introduced it is impossible to determine its overall effect. However, it is likely that the legislation will have an impact upon current farming practices and waste disposal, which includes burning and burying wastes and stockpiling as the new regulations will require the disposal or recycling of agricultural waste in ways that protect human health and the environment. Any waste handled or disposed of on the farm will be subject to waste management regulations, unless it is excluded from control by another regulation. There is a positive side to the legal change expected. This includes drawing attention to the scale and nature of the waste produced within the sector along with highlighting the limited infrastructure currently available for cost-effective waste recovery.

4.8 The National Fallen Stock Directive is expected to be delivered in Spring 2005. This is a DEFRA led industrial consortium and involves an annual subscription for milk round collections to take carcasses away from farms for disposal.

4.9 Other important legislative changes will include the EU Animal By-products Directive, the EU Waste Framework Directive, the Biowaste Directive and the European Fertiliser Regulations.

4.10 Future Agricultural Waste arisings

4.11 The amount of future agricultural waste arisings are likely to remain static (Stakeholder Resource Group, 2004) in line with the arisings shown for 1998 in table 2. Although as stated there is no data for 2001, if we have assumed that waste arisings have assumed static since 1998 we can assume that this is the case for 2001.

4.12 It is difficult to predict any changes which may occur due to the delays in the implementation of the Waste Management Regulations for the waste stream and due to the fact that the industry is subject to a variety of economic trends.

Table 2- Agricultural Waste and By-Products Arising in Hampshire, Portsmouth and Southampton and estimated future arisings for 2010 and 2020

Waste source	2001			2010			2020		
	Arisings (tpa)	% recovered	Volume to be recycled	Arisings (tpa)	% recovered	Volume to be recycled	Arisings (tpa)	% recovered	Volume to be recycled
Animal Matter	909,300	100	909,300	909,300	100	909,300	909,300	100	909,300
Vegetable/Plant Waste	72,500	100	72,500	72,500	100	72,500	72,500	100	72,500
Pesticide Washings	2,800	See note ⁴		2,800	See note ⁴		2,800	See note ⁴	
Plastics/ Polymers	1,100	See note ¹		1,100	See note ¹		1,100	See note ¹	
Tyres	500	See note ²		500	See note ²		500	See note ²	
Vehicles and Machinery	500	See note ² & ³		500	See note ² & ³		500	See note ² & ³	
Oils	500	See note ⁵		500	See note ⁵		500	See note ⁵	
Sheep Dip	400	See note ⁴		400	See note ⁴		400	See note ⁴	
Milk/Rubber/Glass	300	See note ⁶		300	See note ⁶		300	See note ⁶	
Paper and Card	200	See note ⁵		200	See note ⁵		200	See note ⁵	
TOTAL	988,100			988,100			988,100		

(Source: Entec Study, 2004, **Strategic Waste Management Assessment for the South East, Environment Agency, 2000**). Predicted arisings ² & ³ based on stakeholder estimates)

(Notes: ¹ To be considered in the ELV waste stream paper / ² To be considered in the ELV waste stream paper / ³ To be considered in the Metals waste stream paper / ⁴: To be considered in the Chemical and hazardous waste stream paper / ⁵: To be considered in the Paper and Card waste stream paper/ ⁶ To be considered under the glass waste stream paper)

4.13 Future Options for Resource Management

4.14 The minimisation of agricultural wastes must be tackled. There are a number of ways in which this could be done, in particular with regards to agricultural plastics. Farmers, producers and the agricultural industry as a whole should be encouraged to use biodegradable plastics as well as other biodegradable materials. Like many other waste streams (ELV, WEEE), the EU advice on producer responsibility could be rolled out into agricultural waste streams. Better farm waste management may enable future reductions in the amount of bio-wastes produced.

4.15 Drivers for change with regards to waste management in agriculture are growing fast. For example, farmers are facing increasing demands from retailers, and input manufacturers and distributors are facing growing producer responsibility obligations (Environment Agency, 2001).

4.16 The potential for waste reuse and recycling and effective management will have to be realised with the introduction of the new regulations as the proposed extension of controls to agricultural waste will be the most immediate driver for change in waste management practices. The reclassification of some agricultural waste as controlled waste will result in additional requirements for agricultural waste disposal in controlled circumstances. Under the new regulations, farmers will have to either send or take their wastes for disposal at off-farm licensed sites, register a licensing exemption with the EA to recycle waste on farm or apply to the EA for a licence to continue on-farm disposal. There are a number of methods which could be actively encouraged with regards to reusing and recycling agricultural wastes

4.17 Greater use of anaerobic digestion may be an area for further development. The process is not widely used at present due to its costs. However, projects such as the scheme at Windover Farm near Stockbridge are a perfect best practice example of how systems can be successfully implemented in Hampshire. For larger scale projects such as anaerobic digestion plants it could be beneficial for groups of farmers to group together to minimise costs of waste disposal. Co-operative working in agriculture has been to date been quite unsuccessful in the UK. However, great success has been felt in Europe and this success should be worked on within the UK. Greater encouragement and support for such schemes from all levels needs to be established.

4.18 Bulking and transfer facilities could also be set up so farmers can take their wastes to designated sites for further transportation to recycling and disposal facilities. Reading Agricultural Consultants Environmental (RACE) is currently looking into setting up a farm waste recycling schemes across Oxfordshire. This type of systems could be something that is rolled out within Hampshire. It should also be considered that centralised systems of disposal for agricultural wastes such as the systems operated in France where disposal is maintained by local authorities collections should be looked into for

its viability. Wastes are transported away from farms by authorities or private contractors and the schemes seem to be working to great success. This is an idea, which could be implemented in Hampshire with local authority support.

4.19 As currently drafted, the new regulations mean that uncontrolled burning of waste on farm and the use of farm tips will no longer be possible. Disposal ideally would involve dedicated on farm waste storage facilities with re-use and recovery on farm where feasible. It may also involve cost effective collection, recovery and disposal.

4.20 It is likely that the majority of farms wastes (animal matter and vegetable wastes) will continue to be disposed of on farm. Other elements of the waste stream such as Pesticide Washings, Plastics/ Polymers, Tyres, Vehicles and Machinery, Oils, Sheep Dip, Rubber, Glass and Paper and Card will need to be disposed of off site as they are more difficult to deal with due to their nature and they have a greater potential to be reused or recycled. This may include the establishment of a number of on farm waste transfer stations to aid this disposal option. This type of system however will be heavily dependant upon the support of farmers in using such systems. Other options for the collection of such wastes may also include use of HWRC network and existing waste transfer stations for some wastes, a 'milk round' style collections, take back services of specific waste streams by service providers, storage and processing on site where appropriate and farm diversification.

4.21 Social Issues

4.22 The issues of low farmer awareness and motivation for sustainable agricultural waste management must be tackled. The NFU will produce a summary document of the new waste regulations consultation once published to raise awareness of waste management issues to farmers in agriculture. The NFU have also organised a number of awareness raising seminars in particular with regards to the new regulations and these have so far been deemed successful. To further heighten farmers awareness of key issues for the future, these could be extended. Similar awareness raising exercises are also published throughout the year by the NFU.

4.23 Environmental Issues

4.24 The use of anaerobic digestion facilities on farm has many perceived benefits. These include 'reducing the emissions to air (including significant greenhouse gases), reduced odour problems, reduction in the use of artificial mineral fertilisers, reduction in the need for landfill through the increased recycling of waste and the reduction of surface and ground water pollution' (Devon County Council website, 2004).

4.25 For fly tipped wastes it has been suggested that the local authorities could provide collection schemes for fly tipped wastes through skips.

4.26 Economic Issues

4.27 The reclassification of some agricultural wastes as a controlled waste is likely to impose significant additional costs on the agricultural sector. Added costs will be directly associated with the introduction of measures through the Agricultural Waste Regulations as traditional methods are deemed illegal. The costs of disposing of farm wastes under the new regulations will vary according to the type and quantities of waste produced and the type of agricultural activity which takes place. For example, cattle farmers are likely to have much more veterinary, fencing and milk wastes where as cereal farmers (who form the majority of Hampshire's farmers) are likely to produce more chemical wastes through their use of fertilisers and pesticides. The industry has been in recession for the past 7 to 8 years so such costs will be deemed significant, as the costs cannot be passed on

4.28 Although the regulations have been delayed, it can be predicted that wastes such as manures are likely to be exempt from waste management regulations where as other types of wastes such as pesticides, asbestos and paper will be classified as a controlled waste. The disposal of asbestos in particular has been highlighted as a key waste stream which will pose significant costs to the agricultural industry. Farms will need to try to manage their own waste arisings on site so far as possible to minimise costs. However, waste management on farms could also be considered a costly liability that could result in prosecution from incidents polluting local watercourses for example if not managed appropriately.

4.29 The changes to Common Agriculture Policy (CAP) funding will have implications on the operations on land and may lead to greater costs associated with agricultural activity and waste disposal.

4.30 A number of ways that the costs of disposing of agricultural waste can be limited have been suggested in the Agricultural Survey. These include:

- Reducing waste at source; the
- Cleaning of waste to reduce the level of contamination;
- Improved storage to reduce the level of contamination (e.g., storage in a dry, covered area);
- Compaction of waste to reduce the volume;
- Segregation of wastes to facilitate cost-efficient recovery;
- Bulking of wastes to increase the economy-of-scale;
- Securing long-term contracts with waste management companies.

4.31 The cost of implementing new systems of disposal should be carefully considered. Economic limitations greatly impact a farmer's capability of processing and disposing of waste in particular ways. For example, anaerobic digestion and incineration practices will often be unviable due to the costs associated with such systems. Subsidies or capital support programmes could be introduced to help the development of such systems and also help other areas of waste disposal for agricultural wastes. Other associated costs such the time it takes to dispose of waste and the distance to be travelled to do this are also major implications, particularly if new disposal options are trying to be promoted to farmers such as localised facilities.

4.32 The uptake of new schemes will therefore be determined by market forces. Local Authorities should support farmers waste disposal options and should seek to promote ways in which farmers could make revenue out of waste disposal to make it more economically attractive. A number of planning issues should therefore be looked into make it more viable for farmers so convert to such activities. Furthermore, waste management as a revenue option should be promoted.

4.33 Further investigation and promotion of the viability of a number of different methods including worm farming should be considered. Worm farming is a potential method of agricultural bio-waste composting but they are not widespread within the county at the current time.

Further Information

References:

- Consultation on the Working Document on sludge and biowaste (Draft Discussion Document (EC, December 2003)
- Hampshire County Structure Plan 1996-2011 (Review) (HCC, 2000)
- Hampshire, Portsmouth and Southampton Minerals and Waste Local Plan Annual Monitoring Report 2002/3, (HCC November 2003).
- Hampshire Minerals and Waste Framework: Waste Forecasting Draft Interim Baseline Report (Entec, 2003)
- Hampshire Water Strategy, 2003
- National Waste Strategy (DETR, 2000)
- 'No time to Waste' - Proposed Alterations to Regional Planning Guidance, South East – Regional Waste Management Strategy (SEERA, March 2004).
- SWMA for South East (Environment Agency 2000)
- SWMA for South East Annual Updates (Environment Agency 2000)
- Environment Agency Website pages on agricultural waste (Environment Agency, 2004)
- 'Options for agricultural waste collection – a study to help identify sustainable options for the future (Environment Services Association (ESTET), 2003)
- Agricultural Waste Survey
- 'Towards Sustainable Agricultural Waste Management' (Environment Agency, 2001)

Further sources of information

Interviews

John Archer – 4 May 2004

Stakeholder meeting 23 June 2004

Websites www.racesfarm.demon.co.uk

- www.devon.gov.uk/text/renewable_energy_guide_case_study_2.pdf

Appendix 1 Agricultural Waste – Preferred Option

Amount Recycled:	984,200
Percentage Recycling Rate (for resource stream):	~99.6%
Amount Requiring Disposal:	3900

Infrastructure Development
3 small farm-based recycling centres (accepting paper, card, glass, plastic, metals, empty containers) to be co-located with other recycling or disposal facilities (such as those for wood / composting) on farms. Possibly co-operatives.
Collection Systems
-
Policy Issues
Support proposals for anaerobic digestion or other ‘advanced technologies’ for organic wastes, particularly pig and poultry wastes, where energy recovery takes place and particularly if providing or allowing a other waste streams (such as biowaste); Recognise the role of Farm Management Plans in improving agricultural waste management practices; Support the use of CHP on farms.
Actions
Project Integra facilities to be opened up to allow acceptance of recyclables from farms (may need improved facilities)